CLAIMS

1. A method for assaying for potassium ions in a sample, which method comprises:

a) contacting the sample with a potassium dependent urea amidolyase (UAL), wherein the UAL consumes urea and forms P_i and ADP; and

b) assessing the consumption of urea or the formation of P_i in step a) to determine the presence or amount of potassium ions in the sample.

2. The method of claim 1, wherein the sample is a biological sample.

3. The method of claim 2, wherein the biological sample is a blood sample.

4. The method of claim 3, wherein the blood sample is a plasma, serum, red blood cell, or whole blood sample.

5. The method of claim 1, wherein the UAL catalyzes the formation of P_i in the following net reaction:

$$\text{Urea} + \text{ATP} + HCO_3^- + 4H_2O \xrightarrow[K^+,\, Mg^{2+}]{\text{UAL}} \text{ADP} + P_i + 2HCO_3^- + 2NH_4^+ + OH^-.$$

6. The method of claim 1, wherein the amount of P_i formed correlates with the amount of potassium ions in the sample.

7. The method of claim 1, which is used in a prognosis or diagnosis of a disease or disorder.

8. A method for assaying for potassium ions in a sample, which method comprises:

a) contacting the sample with a first composition comprising a potassium-dependent urea amidolyase;

b) contacting the sample with a second composition comprising urea; and

c) assessing the production of P_i to determine the presence or amount of potassium ions in the sample.

9. The method of claim 8, wherein the sample is a biological sample.

10. The method of claim 9, wherein the biological sample is a blood sample.

11. The method of claim 10, wherein the blood sample is a plasma, serum, red blood cell, or whole blood sample.

12. The method of claim 8, wherein the first composition further comprises glycogen, phosphorylase a, oxidized β-nictinamide adenine dinucleotide (NAD), phosphoglucomutase, glucose-6-phosphate dehydrogenase (G-6-PDH), 2-(4-iodophenyl)-3-(4-nitrophenyl)-5(2,4-disulfophenyl)-2H-tetrazolium (WST-1), and 1-methoxy-5-methyl-phenazinium methyl sulfate (PMS), and the second composition further comprises adenine triphosphate (ATP) and $MgCl_2$.

13. The method of claim 12, wherein the second composition further comprises a protein.

14. The method of claim 13, wherein the protein is bovine serum albumin (BSA).

15. The method of claim 12, wherein the second composition further comprises a buffer.

16. The method of claim 15, wherein the buffer is $NaHCO_3$.

17. The method of claim 12, wherein the detectable product is formazan.

18. The method of claim 8, which is used in a prognosis or diagnosis of a disease or disorder.

19. A kit of assaying for potassium ion concentration in a biological sample, which kit comprises

a) a first composition comprising a potassium-dependent urea amidolyase, wherein the amidolyase forms consumes urea and forms P_i; and

b) means for assessing the urea consumed or the P_i formed by the urea amidolyase to determine the presence or amount of the potassium ions in the sample.

20. The kit of claim 19, wherein the first composition further comprises glycogen, phosphorylase a, oxidized β-nictinamide adenine dinucleotide (NAD), phosphoglucomutase, glucose-6-phosphate dehydrogenase (G-6-PDH), 2-(4-iodophenyl)-3-(4-nitrophenyl)-5(2,4-disulfophenyl)-2H-tetrazolium (WST-1), and 1-methoxy-5-methyl-phenazinium methyl sulfate (PMS), wherein the reduction of WST-1 in the presence PMS to form formazan is the means for assessing the product formed if potassium ions are present.

21. The kit of claim 20, further comprising a second composition comprising urea, adenine triphosphate (ATP), a protein, $MgCl_2$, and a buffer.

22. The kit of claim 21, wherein the second composition further comprises a protein.

23. The kit of claim 22, wherein the protein is bovine serum albumin.

24. The kit of claim 21, wherein the second composition further comprises a buffer.

25. The kit of claim 24, wherein the buffer comprises $NaHCO_3$.

26. The kit of claim 19, wherein the kit further comprises a low potassium serum standard and a high potassium serum standard.